National Institute of Environmental Health Sciences

The effect of various temperature indicators on different mortality categories in a subtropical city of Brisbane, Australia

Author(s): Yu WW, Guo YM, Ye XF, Wang XY, Huang CR, Pan XC, Tong SL
Year: 2011
Journal: The Science of The Total Environment. 409 (18): 3431-3437

Abstract:

Background: The relationship between temperature and mortality has been explored for decades and many temperature indicators have been applied separately. However, few data are available to show how the effects of different temperature indicators on different mortality categories, particularly in a typical subtropical climate. Objective: To assess the associations between various temperature indicators and different mortality categories in Brisbane, Australia during 1996-2004. Methods: We applied two methods to assess the threshold and temperature indicator for each age and death groups: mean temperature and the threshold assessed from all cause mortality was used for all mortality categories; the specific temperature indicator and the threshold for each mortality category were identified separately according to the minimisation of AIC. We conducted polynomial distributed lag non-linear model to identify effect estimates in mortality with one degree of temperature increase (or decrease) above (or below) the threshold on current days and lagged effects using both methods. Results: Akaike's Information Criterion was minimized when mean temperature was used for all non-external deaths and deaths from 75 to 84 years; when minimum temperature was used for deaths from 0 to 64 years, 65-74 years, >Euro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin) 85 years, and from the respiratory diseases; when maximum temperature was used for deaths from cardiovascular diseases. The effect estimates using certain temperature indicators were similar as mean temperature both for current day and lag effects. Conclusion: Different age groups and death categories were sensitive to different temperature indicators. However, the effect estimates from certain temperature indicators did not significantly differ from those of mean temperature.

Source: http://dx.doi.org/10.1016/j.scitotenv.2011.05.027

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Meteorological Factors, Temperature

Air Pollution: Ozone, Particulate Matter, Other Air Pollution

Air Pollution (other): NO2

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

Urban

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Australasia

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Morbidity/Mortality, Respiratory Effect

Cardiovascular Effect: Other Cardiovascular Effect

Cardiovascular Disease (other): cardiovascular disease mortality

Respiratory Effect: Other Respiratory Effect

Respiratory Condition (other) : respiratory disease mortality

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Elderly

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified